Status and Potential of Two-Stroke Engine Technology in Montana

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Under a subcontract from
The National Center for Appropriate Technology

Commissioned by the
Montana Department of Environmental Quality
Contract Manager--Howard Haines, Bioenergy Engineer

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EXECUTIVE SUMMARY

This study was commissioned by the Montana Legislature under the guidance to the Department of Environmental Quality[1] to research the status of two-stroke engine technology development in Montana with a focus on identifying the best 'fit' for Montana and advanced two-stroke engines. Additional study elements include the identification of the 'players' or 'stakeholders' in Montana; the Montana market for two-stroke engines; and state-specific technical, regulatory, and/or commercial barriers to this technology, and if they exist, how can they be overcome.

Montana's strongest connection to the two-stroke engine has historically been associated with seasonal recreational uses, i.e., snowmobiling, off-highway vehicles (OHVs) including motorcycles, marine engines and personal watercraft (PWCs) or jet skis. Snowmobiling generates the greatest economic development for Montana, $44 million in nonresident expenditures in 1998[2], in large part due to the activity in and around Yellowstone National Park. Nonresident expenditures were also measured for OHVs and net economic benefits were found to be modest and possibly negative due to trail upkeep costs and low non-resident expenditures. No quantifiable measures were found for PWCs and they are the smallest recreational group of the three. There are an estimated 33,400 outboard motorboats in Montana with the vast majority assumed to be older two-stoke engines.

The use of two-stroke engines in forestry and mining was also investigated. In both applications, the use is quite modest, i.e., there were 1,983 professional 'fallers' and 'buckers' in 1998 statewide and 100 or less two-stroke engines used in today's hard rock mining operations.

There is no research & development (R&D), or manufacturing of two-stroke engines in Montana. A few small Montana-based companies were identified that produce and sell aftermarket specialty components for ultra high performance snowmobiles and OHVs.

The Business Recruiter for the Montana Department of Commerce indicated that the state can only offer modest direct financial incentives for attracting new business and these incentives are provided to local communities which then try to develop matching funds and leverage federal programs such as HUD Community Development Block Grants and US Department of Labor in-plant training dollars. Efforts to recruit small innovative manufacturers to relocate to Montana will need to be spearheaded by local communities or innovative public/private collaborations.

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[1] Funding for this study came through the Petroleum Violating Escrow Fund to be used for more efficient energy usage or petroleum displacements.

[2] Residents also generated an estimated $35 million in in-state expenditures. Eleven million dollars in labor income to Montanans providing goods and services to the snowmobile industry was also generated in in the 1997-98 season as estimated by the University of Montana Bureau of Business and Economic Research.

More stringent Federal environmental regulations set in motion by state agencies such as Montana DEQ, are affecting virtually all applications of two-stroke engines in Montana. The results, still unfolding, will be technology substitution to four-stroke engines, and improvements in two-stroke engines such as the use of fuel injection and adjustable exhaust tuning. In 1999, the State of Montana passed the *Montana No Wake (Jet Ski) Law (HB626)* to counter growing opposition to uncontrolled use of PWCs.

The primary stakeholders include business interests (manufacturers, sales and rental), local economic development organizations (e.g., West Yellowstone and Lincoln Chambers of Commerce), advocacy groups of multiple use for public lands (e.g., the BlueRibbon Coalition) environmental groups (e.g., the Greater Yellowstone Coalition), state and federal land managers (e.g., Montana Department of Fish, Wildlife and Parks, DEQ, US Forest Service, National Park Service, and the US Bureau of Land Management), residents of recreational areas (e.g., the Flathead Lakers), and local and national media.

The stakeholders are, not surprisingly, often at opposition. PWC and snowmobile trade groups are litigating recent court decisions that prohibit the use of their products on certain public lands, most notably, snowmobiles in Yellowstone National Park. In a nationwide poll of 1, 003 likely voters conducted in May 2001,[1] 70 percent of the respondents supported a continued phase out of snowmobiles in Yellowstone National Park even with cleaner and quieter models. This recent poll is being widely published in the wake of the June 24th, 2001 *New York Times* article[2] that the Bush administration may be on the verge of reversing the National Park Service's recommended ban on personal snowmobiles in Yellowstone National Park.

There is also growing local opposition, such as the Flathead Lakers Association and local residents, towards the perceived danger and environmental damage caused by PWCs. In both instances, it is likely that there will be greater limits on access to public lands and that the new models of these recreation vehicles will be quieter and less polluting than the old models. Some Montanans fear that older, more polluting models will be "dumped" in Montana where state and local regulations are less stringent than places such as Lake Tahoe in northern California.

In terms of Montana economic development, the greatest need and opportunity is to preserve and build on the existing tourism base ensuring safety and access to public lands using improved engine technology. It is possible that this emotionally charged public land access issue of motorized recreational vehicles will promote advanced two-stroke engine technology for responsible use on public lands.

I. PROJECT INTRODUCTION

The Montana Department of Environmental Quality (DEQ) contracted with the National Center for Appropriate Technology (NCAT) headquartered in Butte, Montana, with the overall task of researching and promoting *advanced* two-stroke engine technologies. The initial funding for this study came from a legislative appropriation from the State of Montana whose main interest is in wise use of energy resources.

The project has three distinct components.

1. In April 2001 Chrysalis Technology Group, Ltd. of Kirkland, Washington, undertook a baseline review of the status of two-stroke engines and competing technology. The emphasis was placed on larger, two-stroke, spark ignition (gasoline) engines for use in off-road vehicles notably snowmobiles, which have been economically important to small Montana communities. The baseline study also focused on the identification of improvements to two-stroke engines from a national and global perspective, especially with regard to lowered emissions and increased engine efficiencies. The global perspective takes into consideration environmental, institutional and technical barriers and opportunities for increasing market size of advanced two-stroke engines. Alternative technologies were also identified.

2. Under the direction and support of Howard Haines, Bioenergy Engineer, DEQ Planning Prevention & Assistance Division, NCAT staff concurrently developed a comprehensive website on clean snowmobile technology. The address of the forthcoming website is: www.cleansnowmobilefacts.com.

3. This study, ***The Status and Potential of Two-Stroke Engine Technology in Montana,*** is the third component and was conducted by Emily Miller, a technology market research consultant located in Moab, Utah. As the title conveys, this study examines the status and potential of two-stroke engines in Montana.

The service sector, and in particular tourism and recreation, are major industry sectors in Montana and the two-stroke engine has traditionally been used in winter (snowmobiling) and summer (marine and personal water crafts and off road vehicles) recreation. Increasingly environmental pressures are forcing changes in these recreation vehicles. In brief, there is a great deal at stake for the local and state tourism-based economy. To begin to address these issues, the extent or absence of two-stroke engine technology development within Montana are reviewed and discussed along with the statewide marketplace for two-stroke engines.

II. STATUS OF TWO-STROKE ENGINE DEVELOPMENT IN MONTANA: END-USE APPLICATIONS, MARKET CHARACTERIZATION AND STAKEHOLDERS

Research & Development and Manufacturing

This initial aim of this study is the identification of direct linkages in Montana to two-stroke engine technology development. Typically, research and development (R&D) in engine design and/or subsequent manufacture and sales would be found within the manufacturing industry and/or spin-offs from the university system. This study's author could find no R&D or manufacturing of two-stroke engines. Emission studies within Yellowstone National Park were conducted by the University of Denver. Details follow.

The College of Engineering at Montana State University, located in Bozeman, has Montana's only post-graduate level mechanical and industrial engineering program, and to date has had no involvement in two-stroke engine development. In fact, the State of Montana is one of the sponsors of the Clean Snowmobile engineering student competition, which has just completed it's second year (please see http://www.sae.org/students/snow.htm). Professor Doug Cairns of the College of Engineering says that "We were conspicuous in our absence." He explained that funding sources and faculty advocation of a project area must exist, and at the time of this study (May 2001) none have in the area of advanced two-stroke engine development.

Montana State University Northern, in Havre, Montana, has an automotive technology degree program within its College of Technical Services, but no program in two-stroke gasoline engine technology.

WestStart—Western Systems, Technologies & Advanced Research for Transportation– was established in February 1999 as a consortia of 13 western states (including Montana) and three Canadian provinces to promote advanced transportation technology. Montana was briefly considered as a possible site for an advanced transportation business incubator. However this concept never materialized due to Montana's low score on basic siting criteria such as access to markets and strong local financial support.[3] WestStart staff members did express considerable interest in the Yellowstone snowmobile situation; believing that a successful solution in an area with such high national visibility could increase awareness and interest in advanced transportation technology.

From an industry perspective, there are several small Montana-based companies involved in the design or manufacture of snowmobile performance products, but none involving engine design. The largest is *Dynojet Research, Inc.* established in Belgrade, Montana in the 1970s and now the manufacturing base for fuel injection performance products. The company moved its headquarters to Las Vegas, Nevada and its 80 employees are roughly split between the two locations. A company engineer, Jeff Todey, says that the company is hoping and anticipating that four-stroke engines will increase in the snowmobile marketplace and this would benefit Dynojet's fuel injection products.

Another company, *Northern Lites Inc.* of Columbia Falls, Montana, designs and fabricates lightweight snowmobile components such as brakes that are used in high performance snowmobiles and competition motorcycles. The company, started by racecar driver Dennis Kegel, has gone after a narrow aftermarket niche, and employs between 2 and 6 employees. Sales are said to be "way below one million." Kegel believes that two-stroke engine technology must change and reduce the smoke and noise levels. He also asserts that four-cycle engines will become the technology of choice for family snowmobile touring.

Crazy Mountain Extreme in Clyde Park, Montana is another small producer of high performance aftermarket snowmobile products. The company also builds ultra high performance snowmobiles, using existing commercial brands such as Polaris as the base technology. These limited production sleds are priced up to $24,500 or about four times the cost of the average snowmobile.

Montana Applications, Market and Stakeholders in Two-Stroke Engines

Despite the lack of direct linkages with the design and development of two-stroke engine technology in Montana there is a strong interest in and use of two-stroke engines in Montana particularly from the tourism and recreation sector. Even though Montana is 44th in population density, it ranks 11th in the absolute number of snowmobile registrations nationwide. As many as 95,000 Montanans may be snowmobile recreationists—eleven percent of the 902,195 residents counted in the 2000 Census.

Two-stroke engines offer inherent advantages over conventional four-stroke engines of comparable size with respect to size, weight, cost and power. A two-stroke engine can have 40 percent fewer components and be 30 percent lighter than a four-stroke engine. What is probably better known about the (older) two-stroke engines are their high level of noise and emissions. Table 1. provides the number of registered Montana snowmobiles, all-terrain vehicles (ATVs)/off-road bikes, and personal watercraft (PWC).

Table 1. Montana Registrations

	1999	2000
Snowmobiles	20,761	19,462
ATVs/Off-Road Bikes	16,712	20,033
Personal Water Craft	4,520	5,131
Other Motorized Watercraft	46,237	42,114

Source: the Montana Title and Registration Bureau of the Department of Justice, Deer Lodge, MT

Snowmobiles

The most vocal and well-publicized group concerning two-stroke engines are those involved in the Yellowstone National Park controversy over access of snowmobiles powered with two-stroke engines within the park boundaries. Key proponents of private snowmobile use within the park are snowmobile manufacturers, national user advocate groups and some business interests within the community of West Yellowstone, Montana. In April, 2000, a federal ruling called for the elimination of snowmobiles from national parks, including Yellowstone. The International Snowmobile Manufacturers Association filed a lawsuit regarding the process and a settlement negotiation remains underway. Observers say the National Park Service is likely to maintain the ban scheduled to take effect in the winter of 2003-2004 to give snowmobile rental companies time to switch over to snow coaches, van-like vehicles that carry eight or more people at a time.

As a point of reference, the 1992-93 season was the peak year for snowmobiles within Yellowstone National Park with more than 77,000 snowmobiles entering the park which exceeded the projected number for the year 2000.[4] The general trend is that Montana snowmobiling is a growing sport *when the number of nonresident activity days were compared.*[5] From 1993 to 1998, activity increased by 20 percent over the period, from about 185,000 nonresident activity days in 1993-94 to over 222,000 in 1997-1998. During the 1998-99 winter season, more than 62,000 snowmobiles and 1,300 snow coaches brought visitors inside the park. The coaches are required to meet the more stringent emission standards.

In an updated report scheduled to be published in June 2001, *"Snowmobile Contributions to Mobile Source Emissions in Yellowstone National Park"* by Dr. Gary Bishop, et. al. of the University of Denver, the author concludes that the emission rates speak to the need for the snowmobile industry to move away from two-stroke designs to more efficient four-stroke engines.[6] Specifically, Bishop's most recent study shows that snowmobiles account for 33% of the annual emissions of carbon monoxide and 82% of hydrocarbons in Yellowstone National Park using an equivalent best estimate for the summer mobile source emissions.

On April 23, 2001, the National Park Service announced that President Bush has allowed a law eliminating use of private snowmobiles in Yellowstone and Grand Teton National Parks to take effect as scheduled. The Administration's announcement was made in conjunction with Earth Day.[7] In a June 24th, 2001 ***New York Times*** article,[8] it was reported that the Bush administration may be preparing to reverse its prior decision to ban private snowmobiles in Yellowstone National Park. Those close to the negotiations with the snowmobile manufacturers, say an agreement is likely to allow a limited number of snowmobiles equipped with new technology engines and that the industry says are cleaner and quieter.

This latest action is likely to be hotly contested by environmental groups who claim that public opinion is on their side based on a recently conducted national poll.

The results of the Zogby International poll conducted may 14th to May 18th, 2001 are included in their entirety below:

1) *Do you strongly support, somewhat support, strongly oppose or somewhat oppose allowing the use of jet skis, dirt bikes, snowmobiles, and other off-road vehicles in America's national parks?*

- Strongly support: 12%
- Somewhat support: 17%
    - **Support: 29%**
- Somewhat oppose: 26%
- Strongly oppose: 41%
    - **Oppose: 67%**

2) *The National Park Service has a rule prohibiting the use of jet skis in national parks. Knowing this, do you strongly support, somewhat support, strongly oppose or somewhat oppose prohibiting the use of jet skis in our national parks?*

- Strongly support: 46%
- Somewhat support: 14%
    - **Support: 60%**
- Somewhat oppose: 14%
- Strongly oppose: 23%
    - **Oppose: 37%**

3) *The National Park Service has decided to phase out the use of snowmobiles in Yellowstone National Park. Do you strongly support, somewhat support, somewhat oppose or strongly oppose the Park Service's decision to phase out the use of snowmobiles in Yellowstone?*

- Strongly support: 47%
- Somewhat support: 19%
    - **Support: 66%**
- Somewhat oppose: 17%
- Strongly oppose: 12%
    - **Oppose: 29%**

4) *According to the manufacturers, the next generation of snowmobiles will be cleaner and quieter than existing models. Conservation and recreation groups say that even if snowmobiles*

are somewhat cleaner and quieter, it will not stop the threat they pose to public safety and wildlife. Do you think that the newer machines should be allowed in Yellowstone National Park, or do you think that the Park Service should continue to phase out snowmobiles in Yellowstone?

- Continue to phase out: 70%
- Allow snowmobiles: 24%

Source: www.earthisland.org/bW/PLNTWCpoll.html

Estimated Economic Impacts of Snowmobiles in Montana

The most concentrated direct economic impact of the snowmobile ban will be felt by the businesses in West Yellowstone, Montana. The University of Montana Bureau of Business and Economic Research estimated[9] that in 1998, non-resident snowmobilers spent about $200 per activity day statewide, including food, lodging, and often, snowmobile rental costs. In total, nonresident snowmobilers spent over $44 million dollars in Montana during the 1997-98 season for daily personal expenses and *it is estimated that 75% of all nonresident snowmobiling occurred within Yellowstone National Park for an estimated $33 million in local expenditures.* Table 2 details the estimated aggregate nonresidential expenditures of snowmobilers in Montana.

Table 2: Total Nonresident Expenditures of Snowmobilers Throughout Montana, 1997-98

Gas for snowmobiles	$2,842,851
Gas for transportation	3,206,006
Lodging	15,657,962
Eating & drinking places	10,921,362
Grocery and convenience stores	2,112,087
Entertainment and recreation stores	2,118,771
Other retail	2,698,035
Snowmobile dealers and repairs	**4,014,748**
Total nonresident expenditures	$44,131,036

The impact of snowmobile related spending could also be demonstrated in terms of jobs and income. The Bureau estimated that nonresident snowmobilers generate over $11 million per year in labor income for Montanans — or about 800 full and part-time jobs. It is further estimated that one-quarter of these economic impacts occur in the West Yellowstone area. Therefore, 25 percent of $11 million equates to $2.75 million per year in labor income and about 200 full and part-time jobs. Snowmobile rentals and repairs in West Yellowstone amount to $1 million annually. Finally, in West Yellowstone, 28 to 30 percent of resort tax revenues are collected in the winter.

Approximately 25 percent of the nonresident spending becomes direct labor income for Montanans - income earned by people who work in lodging places, eating and drinking

establishments, and other businesses that service tourists. The remaining percentage is spent on items that must be imported into Montana for sale such as film, groceries and clothing. In addition to state income tax generated by service employees, the state treasury gains an estimated $1 million in revenue from the Montana Highway Trust Fund from the state gasoline taxes.

Yellowstone Stakeholders:
Opponents of a Snowmobile Ban:

Bill Howell
Yellowstone Arctic Cat
W. Yellowstone, MT
406/646-7365 (w) –7475 (h)

Bill Howell is co-owner of the West Yellowstone Conference Hotel with 123 luxury rooms and a 10,000 square foot conference center as well as Yellowstone Arctic Yamaha rentals and sales. In anticipation of the tightening regulations on snowmobiles, Howell introduced the first commercially available four-stroke Arctic Cats in time for the 2000-2001 season. Fifty sleds were made available as rentals and 50 more will be added prior to the 2001-2002 season. The customer response was reportedly positive, and Howell says "It is a comfort riding sled that an aging population will appreciate, as well as the lower maintenance and much better fuel efficiency." He says that the ten to fifteen percent price differential can be recovered quickly—within a year or two. He speculates that the two-stroke engine as we know it probably won't exist (in the future).

One of Arctic Cat's primary competitors, Polaris, is going to introduce its prototype four-stroke snowmobile in time for the 2001-2002 season. Only 150 will be produced for the first season, but plans are to ramp up production for subsequent seasons.

Gale Loomis
Traveller's Snowmobile
West Yellowstone, MT
406/646-9332

Another of the largest snowmobile rentals and dealers in West Yellowstone, Traveller's is also the exclusive Polaris dealer for that sales territory. Loomis says that his rental business is planning to offer up to 100 of the new four-stroke Polaris snowmobiles—or one-half of Polaris's total prototype inventory for the upcoming season. At the time of this report (2001), Loomis feels that US snowmobile manufacturers were resistant to change which manifested itself in an arrogance. He points out that Polaris is building its four-stroke model from scratch, unlike Arctic Cat, and the company has committed substantial funds in R&D.

Traveller's Snowmobile wanted to equip fifty of its fleet with the prototype retrofit kit for reducing snowmobile emissions that had been developed by Atomized Fuel Technologies, Inc. (please see www.aftcarbs.com). The company, AFT, was contacted

by the Chrysalis Technology Group, Ltd. in the two-stroke engine baseline study and is included under the report section ***Potential Solutions.*** In brief, the intent is to offer kits for retrofitting engines of major snowmobile manufacturers with atomizing carburetors and catalytic converters at a cost of about $750. AFT carburetor and catalyst technology was fitted to one of Traveller's Polaris 550 snowmobile engine, and tested by an independent testing laboratory. Since the laboratory results were positive, Gale Loomis intended to purchase fifty retrofit kits, but abandoned the project when a purchase price could not be agreed to between Travellers and AFT.

Another significant stakeholder, the **BlueRibbon Coalition,** aims to keep federal land open to multi-use and in particular, OHVs through legislative lobbying activities and litigation. Within the Yellowstone area Vicki Eggers is the Blue Ribbon Coalition Outreach and Education Specialist. Vicki Eggers said that a recent trip to the east coast reminded her of the importance of informing people about what was really happening in Yellowstone National Park and that the snowmobilers were not harassing wildlife as many of the public believed. Contact information is:

National Membership, 1-800-258-3742, www.sharetrails.com

Vicki Eggers, 406/646-9646 email: viki@gomontana.com

Proponents of a Snowmobile Ban:

Jon Catton, Communications Director
Greater Yellowstone Coalition
Bozeman, MT
406-586-1593
www.greateryellowstone.org

The Greater Yellowstone Coalition (GRC) operates from private foundation and donor funding that amount to about $2 million/year. Although the defense of the National Park System final ruling is a high priority of the GRC, this issue is "one of many" for the organization. According to Catton, even if snowmobile emissions and noise levels were reduced, the ban would still stand due to their adverse impacts on wildlife and health of workers *unless* the Final Rule is overturned. As of the time of this writing, the snowmobile manufacturers as represented by the International Snowmobile Association were in closed negotiations with the Department of Interior in response to the manufacturers' lawsuit.

Other environmental groups with a vested interest in the outcome of the national parks snowmobile and jet ski bans, with offices in Montana include:

Montana Chapter of the Wilderness Society
Bozeman, MT
406/586-1600
Contact: Bob Ekey
www.montanaws.org

Montana Wilderness Association
Madison-Gallatin Alliance (one of six chapters)
Bozeman, MT
406/582-8600
www.wildmontana.org

National Parks Conservation Association
Helena, Montana and Washington, DC
Contact: Tony Jewett, Helena 406/495-1560
Kevin Collins, Washington, DC 202/454-3392
www.npca.org

Kevin Collins, legislative liaison for the National Parks Conservation Association provided testimony on July 13, 2000 to the US House Small Business Committee's Subcommittee on Tax, Finance and Exports. The testimony argues that a ban on snowmobiles will not impact the local economy of West Yellowstone as much as the community has estimated. Below is an excerpt of his testimony:[10]

> "The economist on contract with the Park Service for economic analysis for the EIS recently conducted an economic impact assessment for the five surrounding counties. He found that the impact to West Yellowstone would be barely perceptible, even without mitigating efforts such as expanded marketing to attract other winter visitors. (John Duffield, Bioeconomics, Inc.)
>
> The economic analyses for the snowcoach only alternative (G) were computed in two ways. Each was based on an assumed 33 percent reduction in winter visitors, with 37 percent of nights spent in West Yellowstone (out of the five surrounding counties). Local multiplier effects are included. One method predicted an approximately $4.5 million impact.
>
> A second method estimated an approximate $5.2 million impact. In economic terms, these two figures are so close as to be virtually the same.
>
> The winter economy in West Yellowstone has been stable since the 1980s, with no significant growth[3]. In contrast, the summer economy has been growing steadily within normal economic fluctuations. The local economy is driven by park visitors, and as a whole (summer and winter) has been growing at 10 percent per year because of summer growth.

[3] It is noted that Duffield's analysis was based on the resort tax and exludes such revenue generators as snowmobile sales and rentals. Taking account only of the drop in room rentals, Duffield's work estimated a $8.9 to $11 million reduction in locally generated business.

> Significantly, there have been fluctuations of up to 15 percent in one year from which the economy has recovered without adverse or lasting effects. For this reason, Duffield categorized the potential $5-million loss to West Yellowstone's winter economy as inconsequential to the economy as a whole and not involving adverse, lasting impacts. Furthermore, with an aggressive marketing scheme to attract new and replacement visitors and an expanded fall shoulder season, the dip in winter revenue can be mitigated further".

Snowmobiles, Other Areas of Montana

The 1998 BBER study estimated that ten percent of Montana households owned one or more snowmobiles. Translated into the number of recreationists, BBER says the data suggests that as many as 95,000 residents are snowmobile recreationists. Residents identified the number one issue facing snowmobilers as maintaining open access to public lands. (Impact on the environment was cited as the number one issue by less than ten percent of the snowmobile population surveyed).

The Montana Snowmobile Association was also contacted and has a broader interest in maintaining access to federal lands but is still a stakeholder in Yellowstone National Park.

Fay Lesmeister, President
Montana Snowmobile Association
Fort Shaw, MT
406/264-5393

The Montana Snowmobile Association has between 1,800 and 1,900 members. Lesmeister says that their group is pushing for quieter snowmobiles and for better gas efficiency. He believes that the four-stroke engine snowmobile will be the future direction and is ideal for trail riding and most use in the Midwest and the Eastern US. He acknowledged that the drawbacks are a heavier sled with greater mechanical complexity. Most snowmobilers trade in their snowmobiles every four years or less to get the latest technology. Two-stroke snowmobiles, he believes, will have continued market share for mountain travelers.

Because snowmobiling in Montana is relatively dispersed, the exception being the Yellowstone National Park area, the stakeholders are generally the 32 local snowmobile groups (see www.mtsnow.org) and chambers of commerce in the communities where there are nonresident snowmobile recreationists. These areas include the Big Hole Valley, Lookout where Idaho and Washington residents make day-trips; and in northwestern Montana where Marias Pass and Eureka draw some limited Canadian visitation. Smaller numbers of nonresident snowmobilers also visit Cooke City, Lincoln, and Seeley Lake.

Returning to the 1998 snowmobile study conducted by the BBER, the economic inflow into these areas (excludin*g* West Yellowstone) from expenditures of nonresidents are estimated to be $33 million a year and the creation of 600 full and part-time jobs for Montanans.

In concluding this section identifying the stakeholders in Montana snowmobiling, it is interesting to note that the most frequently cited issue of all snowmobilers (resident and nonresident) is access to snowmobiling areas with safety factors the second most common issue. Less than 5% of respondents to the survey identified smoke emissions or noise issues. It is the sense of this study's author that there is a discernible shift in attitudes about noise levels and emissions since the time that the BBER survey was conducted in 1998 driven in large part by the closure of some national parks and ongoing pressure by environmental groups to close additional federal lands. As a result, a cleaner, quieter snowmobile, two- or four-stroke, will have a more receptive marketplace.

Watercraft

Total motorized watercraft in Montana amounted to about 50,000 in 1999 of which approximately 33,400 are outboard motors, 12,100 are inboard motors, and 4,500 are personal watercraft according to the National Marine Manufacturers Association (NMMA) of Chicago. Jim Petru, statistics manager, also reports that Montana outboard engine sales ranged between 894 engines in 1997 and a high of 1,262 engines in 2000. He speculates that even today less than fifty percent of new outboard engines sold are not compliant with the EPA regulations scheduled to take effect in 1996. While the Honda engine is advertised to exceed EPA regulations, Honda is a relatively small market player according to Mr. Petru. The "Big Three" manufacturers, Brunswick, Bombadier, and Yamaha, are extremely closed mouth, even to the NMMA, about what percentage of their new model engine unit sales are in compliance with the stricter regulations. Another barrier is the substantially higher price of the four-stroke outboard engine as compared to a two-stroke engine—up to 50 percent more. Finally, Petru notes that two-stroke outboard motor engines are commonly in use for twenty or more years if maintained. In conclusion, it is probably safe to assume that the vast majority of the 33,400 outboard motorboats in Montana are older two-stroke engines.

Personal Watercraft

In 1996, the Glacier National Park Superintendent banned personal watercraft (PWC) from Lake McDonald. This was preceded by the July 1990 ban on PWC on Lake Yellowstone enacted by the Park Superintendent in anticipation of potential problems[11]. In the 1999 session of the Montana State Legislature, House Bill 626, *The Montana No Wake (Jet Ski) Law* was introduced and passed. In brief, it recognizing the growing conflict between PWC recreationists and non-users, it prohibits the use of PWCs on certain waters by rule of the Montana Fish Wildlife and Parks Commission, and establishes a 200-foot safety zone from the shoreline. It was enacted in June 1999. Since then, new legislation was introduced and passed to include additional provisions due to increasing public concerns.

Last year, the US National Park Service banned personal watercraft (PWC) from two-thirds of all National Parks. In a recent settlement (December 2000) between the US Department of Interior and the Bluewater Network, a project of the not-for-profit Earth Island Institute, (please see www.earthisland.org) the two parties agreed that the remaining 21 parks would be included in the ban unless the DOI could prove that the machines do not harm the environment. The story continues to unfold —- in April 2001 the Secretary of the Interior, Ms. Gale Norton, ordered a temporary suspension of the ban and commenced a review of four national parks, all on the east coast.

These details are presented to illustrate the rapidly changing situation with major consequences for the personal watercraft industry. While the number of PWCs in Montana is considerably lower than snowmobiles—approximately 5000 or one-quarter of the number of snowmobiles based on registrations data from with the Montana Title and Registration Bureau in 2000—its data also shows that eighty percent of PWCs are five years or older. [12] While the two national parks prohibit PWCs, Flathead Lake, the largest freshwater lake wholly within the contiguous 48 states, and the Thompson Chain of Lakes, all in northwestern Montana, remain open to PWC recreationists and are beginning to generate local controversy.

The Flathead Lake Monitor (Summer 2000 edition) states that….

> "Of all the problems, concerns and issues members (of the Flathead Lakers, a voluntary association of 1000 homeowners and concerned public—please see www.flatheadlakers.org) and the public bring up to the Flathead Lakers's board and staff, PWC top the list. We have heard stories of inconsiderate and dangerous operator behavior and wildlife harassment…We've also heard about long-term area residents responsibly and courteously enjoying using their PWC."

In response to the concerns the Association has formed a subcommittee and developed a survey of its 1000 members to research, develop and analyze options and make recommendations for addressing problems associated with PWCs. Larry Hanzel, Vice President of the Flathead Lakers Association, feels that the PWC noise level is the main issue, followed by safety. According to Board Member Rose Schwennesen there is increasing concern over the release of MTBE[13] in the lake's water, and concern that Montana will become a dumping ground for California's banned two-stroke engine-powered PWCs.

Region One of Montana Fish Wildlife and Parks also conducted public scoping on "motorized watercraft conflicts and opportunities" and of the 438 surveys returned 325 felt that a problem exists. The most frequently proposed solution was the placement of restrictions on PWCs.[14]

The PWC industry has responded to the increasing pressure for reduced noise and emissions levels with new models that lower emissions by 75% through use of fuel

injection and variable exhaust ports or four-stroke engines. The Personal Watercraft Industry Association (please see www.pwia.org) states that many of the 1999 watercraft are 50 to 70 percent quieter than 1998 models. Manufacturers have achieved these reductions through the use of various techniques including intake/exhaust system redesign, active noise-canceling devices, engine/drive train isolation and additional noise suppression materials. Honda's four-stroke engine is pointed out as being notably fuel efficient and quiet.[15]

In sum, PWCs in Montana are a growing source of conflict and contention between users and non-users. Stakeholders include these two groups, as well as local and state officers and legislators, environmentalists, PWC manufacturers and rental/sales business persons.

All Terrain Vehicles/Off-Highway Vehicles

In 2000, the number of registered ATVs and dirt/trail bikes (referred to in combination as off-highway vehicles or OTVs) slightly exceeded the number of snowmobiles in Montana in contrast to recent years. [16] An estimated 12 to 13 percent of Montana households own one or more OTV—the same percentage of household owning snowmobiles.[17] However, this group is less cohesive and organized with only two associations in Montana (please see www.atvsource.com/clubs/state/montana) as compared to 33 state and local snowmobile associations. There are a number of unregistered vehicles used in ranching and other agricultural operations as well.

In 1996 the University of Montana Bureau of Business and Economic Research (BBER) was commissioned to estimated the economic benefits of OHV recreation in a ten-county area of southwestern Montana, using Boulder, Montana as the 'epicenter' of activity. The study estimated that the total annual expenditures for the study region was about $3.3 million, of which half was used in gasoline expenditures. By and large OHV recreationists were likely to make day trips. The author, Jim Sylvester, said in an interview for this study that the economic benefits were negligible or even negative after expenses for trail upkeep and enforcement were accounted for.[18]

As with snowmobiles and PWCs, more four-stroke OTVs are being introduced and sold due to their gas efficiency and lower noise and emission levels. However, those looking for a faster, lighter and more responsive vehicle for competition or mountainous terrain, favor two-stroke models.

Don Adador, the Blue Ribbon Commission Western Representative, estimates that about 60% of dirt bikes are two-stroke due to the attributes mentioned. In comparison, the newer four-stroke engine models are increasingly appealing to entry-level and general trail riders.

Despite repeated efforts to speak with the Montana ATV association representatives, no contact was made.

Forestry

Two-stroke engines are used in professional power chain saws utilized by Montana forestry personnel. According to the Montana Department of Labor's program on Occupational Employment Statistics most recent survey (1998) there were 1,983 'fallers and buckers.' [19] It was projected that by 2008, there will be a growth of 186 Faller and Bucker positions in Montana. These statistics give a good proxy of the approximate number of professional power chain saws in current and projected use in Montana.

Paul Uken, the Safety Ranger with the Montana Logging Association, says that they are beginning to see new power saws with emission controls. The woodcutters find them more difficult to keep adjusted and report there are more breakdowns and less power. As a result, Uken says that some of the men try to remove the emission controls.[20]

Dr. Martin Moss who is the Head of Engineering Quality Services of Stihl Power Tools, one of the largest chainsaw producers worldwide, was interviewed. Moss stated that the future direction of professional power saws is a mandatory tightening of emissions control as set forth by the US Environmental Protection Agency (please see: http://www.epa.gov/otaq/regs/nonroad/equip-ld/hhsfrm/f00007.pdf). He expects the price and the weight of handheld professional power saws to increase about ten to fifteen percent, and said that the increased weight will be especially unpopular to professional loggers who work ten and twelve hour days. While two-stroke engines will not be replaced with new technology, manufacturers are being forced to make major system changes in order to comply with the environmental regulations that began in California under its California Air Resources Board and is the model behind the US EPA regulations.

Mining Equipment

Two-stroke engines have been used in mining operations for portable air and water pumps and small compressors. However, according to Professor Philip Patton, instructor of mining methods and engineering at Montana Tech, the use of two-stroke engines today is rare. He says that they are not heavy or durable enough for commercial mining operations and that diesel engines are the norm. Based on approximately twenty-four hard rock mines in operation in Montana today, plus the miscellaneous "mom and pop" mines, Professor Patton estimates 100 two-stroke engines are in use today in Montana's mining industry.

III. BARRIERS CONFRONTING TWO-STROKE ENGINE AND MARKET DEVELOPMENT IN MONTANA

Montana-Specific Barriers

1. ***Lack of a significant manufacturing base and infrastructure.*** Snowmobiles, personal watercraft, and off-highway vehicles are produced by a relatively small number of well-established manufacturers that are located in areas, e.g., southern California and Michigan, with an extensive manufacturing infrastructure already in place. Subcomponents parts and services, skilled labor, existing distribution channels and transportation access, and close proximity to major markets and population centers are some of the key ingredients of a vibrant vehicular manufacturing base.

   In contrast, the Montana economy is based primarily on agriculture, retail and wholesale trade and services (especially medical), construction, government and tourism related activities. While Montana is the fourth largest state geographically, its population of just over 900,000 is the size of many smaller American cities. In 2000, only 5.3 percent of the Montana labor force worked within the manufacturing sector. [21]

2. ***Lack of sufficient state economic incentives to attract existing smaller businesses.*** Given the state's limited manufacturing base and ability to attract large companies, the opportunities to attract small but growing ventures, such as companies that provide products for the after-market, may be more promising. As noted previously, Montana has a few businesses that design and manufacture after-market products for the high-performance segment of snowmobiles and OHVs. All of these are home-grown, involving Montana native or current residents.

   Small innovative companies that produce aftermarket products such as emission and noise control retofit kits would meet two mutually compatible objectives—providing new economic development opportunities in Montana and providing solutions to address noise and emission problems with the existing inventory of snowmobiles, PWCs and OHVs.

   Typically efforts to attract such companies involve public/private sector partnerships and economic incentives to compensate the entrepreneurial firm for relocation. In Montana, according to the Department of Commerce's Business Recruitment Officer Quinn Ness, there are only limited direct financial state incentives that go to the local government participants in the Montana Certified Communities Program. This program provides matching funds of $5,000 to $25,000 to the local

communities. A complete profile of Montana Business Incentives is included in the report Appendix. It is the author's opinion that efforts to target and attract innovative small manufacturers will require local community private/public partnerships. This topic is addressed further in Section IV, Potential Solutions.

3. ***Lack of advanced engineering programs addressing two-stroke engines at Montana's universities and technical colleges.*** At the time of this study (May 2001), there are no programs or centers of technical excellence in the area of advanced two-stroke engine design from which entrepreneurial activities can spinoff. If one existed, Montana State University is the logical place for such a program.

   Typically university-based centers of excellence evolve out of a state's economic heritage, (e.g., Michigan universities and their advanced studies in automotive design, the University of Montana and its well-respected forestry program). Programs and centers also develop to meet the needs of the new information economy—such as the computer science programs in essentially all institutions of higher learning.

   Advanced two-stroke engine design does not fit the first criteria—economic heritage— and it is questionable if there is a sufficient unmet need or 'sex appeal' for the formation of a new program in Montana. Dr. Doug Cairns of Montana State University said there needs to be funding and advocation for a new 'clean engines' program of study in Montana, and to date, neither exist.

Other Barriers

1. ***Technology-substitution that lessens demand for two-stroke engines.*** There is no doubt that four-stroke engines are becoming the technology of choice for recreation vehicles in markets with tightening environmental controls. While the manufacturers have been slow to change over, they have finally made the transition as well as making the necessary capital investment in research and development, and retooling their plants and equipment. And with additional capital outlays, one can expect greater sales and marketing efforts from the manufacturers to promote the newest technology and recover their investments.

   In terms of the effects in Montana, rental and sales will be most directly affected, but probably not adversely. Businesses have already begun to promote the advantages of the quieter and more fuel efficient four-stroke models of snowmobiles, PWCs and OHVs. It is likely that rental and sales businesses will carry a mixed inventory of two-stroke and four-stroke. The

larger more profitable rental businesses already are accustomed to turning over their rental inventory frequently and getting in the latest models.

2. ***Federal regulatory issues likely to remain under pressure and the scrutiny of the public eye.*** The public has become more knowledgeable and concerned over the continued use of the old two-stroke technology. At the time of this writing, environmental groups and industry representatives are locked in litigation over the access for OHV's to public lands. The strong tensions that have developed are not likely to dissipate soon.

   These conflicts have caused some industry and traditional recreationists to rethink the issues of environmental emissions and noise levels and to publicly state their support for cleaner and quieter vehicles. This overall movement and support towards a cleaner engine will further encourage technology substitution or the redesign of the two-stroke engine. This could be a positive or negative impact on two-stroke engines depending on the future direction taken by the manufacturers.

   Two-stroke engines will continue to be favored by those looking for a higher performance and horsepower snowmobile to work in deep powder snow.

3. ***Negative public perception among the general public.*** One member of the pro-motorized access Blue Ribbon Coalition said that there was a mis-understanding by the general public about snowmobiles in Yellowstone National Park and their impact on wildlife (especially buffalo) due to misleading national media stories. A member of the Flathead Lakers Board of Directors said that there is concern that northwest Montana will become the dumping ground for the old models of PWCs now being prohibited by certain recreation areas such as Lake Tahoe, California. While these stories are different, they both convey a negative perception by members of the general public towards recreation vehicles and/or their operators.

   The growing negative public perception towards land and water personal recreation vehicles is another source of major pressure on the manufacturers to change the negative public image by reducing the environmental impacts and encouraging more responsible behavior by the operators. In any event, the industry status quo of the last decade and a half is no longer being tolerated.

4. ***Manufacturers have been slow to embrace advanced two-stroke engine technology development.*** This is particularly true with snowmobile manufacturers. Only recently have snowmobile manufacturers come forward publicly with new two-stroke engine designs. By the second year

of the ***Clean Snowmobile Challenge*** all four major manufacturers participated in contrast to the first year. While this student competition has only completed its second season, it has been very positive in terms of generating support and solutions to solving the issues of emission and noise of snowmobiles. The Clean Snowmobile Challenge has been covered by the national media and has generated excitement among the contenders. And perhaps most importantly, manufacturers are finally taking notice.

IV. POTENTIAL SOLUTIONS

There is no easy or obvious solution to the attraction or creation of innovative small manufacturers dedicated to the advancement of two-stroke engine technology in Montana. For this to possibly occur there would need to be a champion of the cause, possibly one of the local economic development authorities that could assemble a reasonable package of economic incentives combined with a 'quality of life bonus' (i.e., appealing to business people who are interested in more easily participating in outdoor recreation than is possible in industrial or populated areas of the country). It may also be possible to work with the existing small Montana manufacturers such as Dynojet Research Inc. to include environmentally beneficial aftermarket products to their offerings. Perhaps these companies could license technologies and forego the costly research and development phase. But foremost, there needs to be a dedicated champion of this technology development effort from the stakeholders and, in particular, the university community. Possible sources of funds and champions are:

- A Center of Excellence or a clearinghouse dedicated to advanced two-stroke engine development, housed at the National Center for Appropriate Technology or some other Montana-based organization interested in promoting energy conserving technologies
- Federal and foundation grant opportunities
- Private/public collaboration between a Montana-based Center of Excellence and a manufacturer(s) of advanced two-stroke engines

Preserving Montana's outdoor recreation activity in a way that doesn't further degrade the environment is of greatest importance in terms of longstanding economic benefits to the State and the residents of Montana. Adopting this goal may require some degree of technology substitution, i.e., to a four-stroke engine and the use of fuel injection on two-stroke models.

Supporting the participation of Montana State University's Mechanical and Industrial Engineering Program in upcoming Clean Snowmobile Challenges will have several benefits. If done properly, this could become a catalyst that raises the level of technical expertise within Montana. And in a state where entrepreneurial activities are often the best means to acquiring job satisfaction and security, students may decide to venture out and begin their own manufacturing business of environmentally friendly products. It has happened in computer software development.

Despite the adversity felt by some manufacturers of encroaching environmental controls and limiting access to certain public lands, a new market is simultaneously being created for quieter, safer, and more fuel efficient personal recreational vehicles. The introduction of this new product generation may appeal to more people who view it as a family activity that doesn't require rigorous physical conditioning (ie, the aging baby boomers who are looking to find suitable substitutions for more risky and strenuous recreational pursuits such as mountain biking or skiing). In short, out of adversity may come a larger more diverse customer base.

While Montana's stakeholders are extremely diverse in their specific objectives, they do share in the overall goal of maintaining Montana's natural environment and appeal. Actions should be continued to ensure that the old two-stroke engine is replaced with a cleaner, more efficient technology.

ENDNOTES

[1] Zobgy International poll conducted May 14 to May 18, 2001 as reproduced by www.earthisland.org.

[2] Seelye, Katharine Q., "Bush May Lift Park's Snowmobile Ban," **New York Times,** June 24, 2001.

[3] An informal history of West Start and its involvement in Montana was provided by Mike Morris of the National Center for Appropriate Technology, Butte, MT.

[4] National Park Service. *Winter Use Plans: Final EIS for the Yellowstone and Grand Teton National Parks and John D. Rockefeller, Jr. Memorial Parkway*, National Park Service, Denver, CO 2000.

[5] Sylvester, James, T., **Snowmobiling in Montana—A 1998 Update,** Bureau of Business and Economic Research, University of Montana, Missoula, MT October 1998.

[6] See http://pubs.acs.org/reprint-request?es0105131/X2Tv

[7] "Bush won't overrule park snowmobile ban", **Billings Gazette,** April 24, 2001 as reported in www.wildmontana.org

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[10] See http://208.226.12.12/media_center/testimonies/testimony071300.asp

[11] Interview with Chris Hansen, Yellowstone National Park enforcement operations.

[12] Interview with Rose Schwennesen, Board Member, Flathead Lakers Organization.

[13] MTBE (methyl tertiary-butyl ether) is a volatile organic compound made as a byproduct of petroleum refinery operations by combining methanol derived from natural gas and isobutylene. MTBE is used as a gasoline additive, octane enhancer or oxygenate.

[14] ***Flathead Lake Monitor,*** Summer 2000 edition, page 5.

[15] Interview with Dr. Gary Bishop, University of Denver Department of Chemistry and Biochemistry.

[16] Montana Title and Registration Bureau, Deer Lodge, MT 406/846-6005.

[17] Sylvester, James, T., **Off-Highway Vehicle Recreation in Southwest Montana,** Bureau of Business and Economic Research, University of Montana, Missoula, MT, 1996.

[18] Interview with Jim Sylvester, Missoula, Montana, April 2001.

[19] Fallers are workers who fell trees and saw into specified log lengths, working alone or as a member of a team. The bucker saws trees into specified lengths after the faller has cut the tree to the ground.

[20] Interview with Paul Uken, Safety Ranger, Montana Logging Association.

[21] **Montana by the Numbers,** http://ceic.commerce.state.mt.us/Demog/Mtbynumb.pdf

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APPENDIX:
Montana Business Incentives

MONTANA BUSINESS LOCATION - POTENTIAL FINANCING OPTIONS[21]

The purpose of this information is to outline potential sources of grant and lower cost fixed rate interest loan funding for relocation projects in Montana. The funding sources are a combination of local, state, and federal loan and grant programs and tax incentives. Many community areas have major universities, international airports, existing industrial parks with available land, railroad access or potential access, interstate highways, natural and cultural amenities and sophisticated local governments capable of arranging complex financial and tax incentives for new business expansion.

The following programs and sources of funding may vary in size and applicability depending on the provision of more detailed project information and site location. The funding sources are organized by grants and quasi-grants, tax incentives, and loans.

GRANTS AND QUASI-GRANTS

Creation of Tax Increment Financing District

State law provides for the creation of a tax increment financing industrial district for industrial development projects. A local government may issue bonds for a wide variety of development purposes such as: financing land acquisition; industrial infrastructure; rail spurs; buildings; and personal property related to the public improvements.

The incremental increase in the tax base over the unimproved value before the project was developed can be committed to repayment of the bonds. The bond financing can essentially be considered a grant by the business because taxes paid will directly benefit the district. The actual amount of bond financing available is based on the ability to repay the bonds with the incremental value of the tax increase.

Montana Board of Investments

Infrastructure Program

The Montana Board of Investments (MBOI) may loan funds to a local government for public infrastructure improvements. The local government repays the loan from fees and assessments to the business using the infrastructural improvements. The business may write off up to 100%
of the related fees and assessments paid to the local government on its Montana income tax as it documents the related job creation. The infrastructure improvements function like a grant to the business as a direct reduction of project development costs. The business to be assisted is analyzed by MBOI and the final decision is based on the strength of the business project being financed. The actual benefit to the company is limited by the number and quality of jobs created and the ability of the business to write off the tax credits on its actual income tax liability. Infrastructure loans are limited to $16,666 per job created as a result of the project. The minimum loan amount is $250,000.

Aerospace and Technology Infrastructure Development Program

The State of Montana may issue and sell up to $20 million in general obligation bonds for aerospace transportation and technology infrastructure development projects. The state would own the improvements funded and would lease the infrastructure to the local government tax increment financing district or the business being assisted. The lease amount would be set at a nominal fair value taking into consideration job creation and overall tax revenue generated by the project. The statute provides for the principal and interest payback of the bonds from increased state taxes generated by the projects funded.

Montana Department of Commerce Economic Development Finance Program (CDBG)

Up to $400,000 in grant funds is potentially available for local grant applications involving city and county governments from the Department of Commerce. Depending on the potential size of the project, it is possible to combine grants to the county and the city for a total of $800,000 in potential grant funding in special circumstances. The grant funds may be used for infrastructure and for the direct cost reduction of training expenses incurred by the company. The amount available is limited to $5,000 per employee trained and $15,000 per full time-equivalent employee hired for infrastructure projects. In addition, many localities have local CDBG funds potentially available for projects.

TAX INCENTIVES

New or Expanding Industry Wage Credit

A new or expanding manufacturing corporation may receive a corporation license tax credit of 1% of wages paid to new employees for the first 3 years of operation and expenses.

Local Option Property Tax Incentives

New and expanding industries may be taxed at 50% of taxable value for the first 5 years after a construction permit is issued. The tax rate is increased incrementally over the next 5 years to 100% after ten years at the option of the local government.
NOTE: A lower tax rate reduces the capacity for tax increment bonding.

There are numerous specialized tax incentives which can be researched with the Department of Revenue on a case by case basis.

LOW INTEREST LOANS

The Montana Board of Investments (MBOI) may participate in bank loans up to a maximum of approximately $6.4 million. MBOI may participate up to 80% of a bank loan made in Montana. The MBOI participation can provide for fixed loan rates as low as approximately 5-6% depending on the strength of the borrower and the number of jobs created. Interest rates may be lowered by up to 2.5% for the initial $6.4 million if a business project involves the creation of up to 50 new jobs paying higher than an established benchmark. The bank portion of the loan is priced by the lending institution and may be fixed or variable.

MBOI may also purchase federal loan guarantees, such as Rural Development Business and Industry Guarantees, and provide the same low fixed rate advantages and job creation interest rate reductions to the business as the loan participation program described above. MBOI may participate at a higher level if loan guarantees are available for loans exceeding the $6.4 million limit. Although the interest rate would still be fixed for loan participations exceeding $6.4 million, the job creation interest rate reduction would not apply for the amount exceeding $6.4 million.

New $50,000,000
2% Interest Funding Set-aside

Businesses producing value-added products and commodities and that project the creation of 15 or more additional jobs are eligible to apply through a bank for an MBOI loan participation. There is the potential for an eligible business to receive up to $6.4 million with a 2% fixed interest rate for the first 5 years of the loan term. Participating banks may not require personal and/or corporate guarantees. There is no provision for job creation based interest rate reduction because of the low initial rate.

Montana Department of Commerce Economic Development Finance Program (CDBG)

Loans of up to $400,000 can be made to businesses creating new jobs in Montana. Up to $15,000 dollars is available for each full-time equivalent employee projected to be hired as a result of the business project financed. The current interest rate is a fixed 8% and is loaned over variable terms depending on uses of funds. Payment deferrals are negotiable and loans can be subordinate to other lenders if necessary and appropriate for the project to proceed. Local governments would apply on behalf of the business and receive a grant from the Montana Department of Commerce. The local government would provide the granted funds as a loan for the business.

LOCAL DEVELOPMENT PROGRAMS

All major, and most smaller, communities in Montana have local development corporations with local programs that can enhance total finance packages and assist with business location issues. The Department of Commerce regularly works closely with local development corporations to assist with business location projects by combining resources as much as possible.